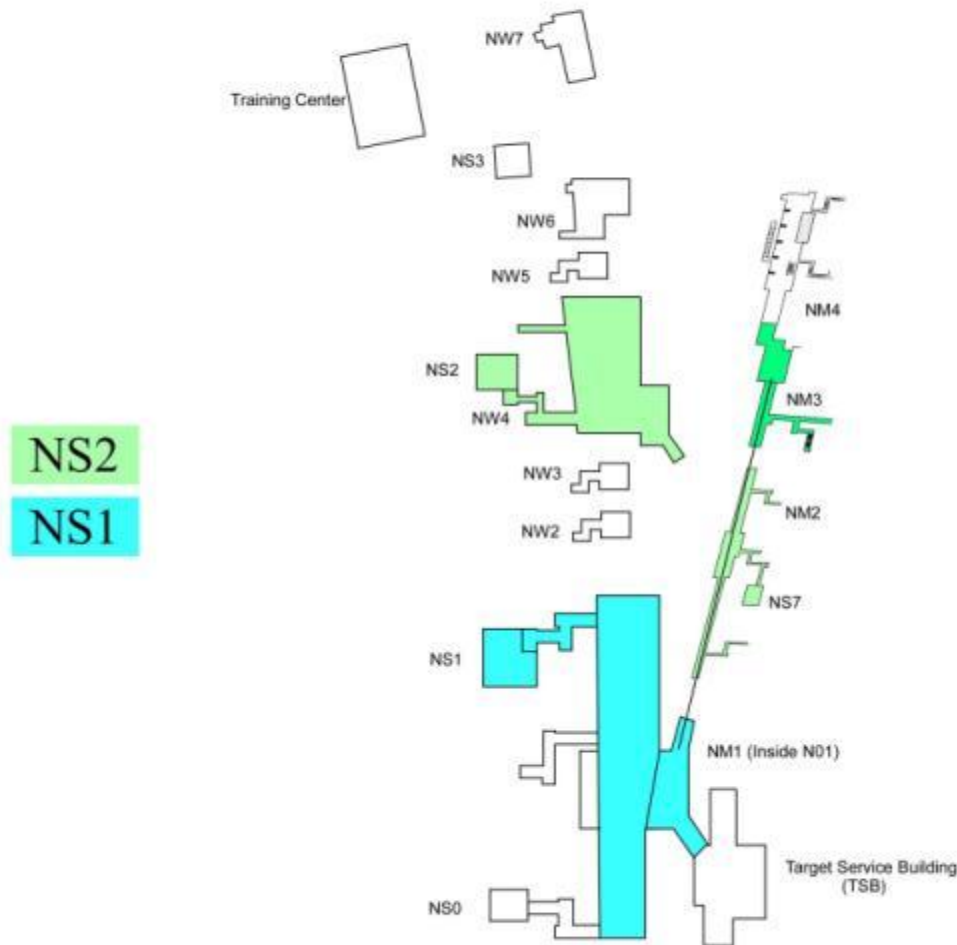# Turning on the NS2LCW System, and filling the expansion tank when needed.

In the Neutrino beam line we have 2 LCW systems located at NS1 & NS2 and 1 RAW system located at the SeaQuest Service Building.

Fermilab - Neutrino Area LCW

This map shows what areas, Service Buildings and enclosures, the 2 LCW systems cover.

spb 23 June 2011

NS2 LCW System

The NS2 LCW system supplies cooling water for the Power Supplies in NS7, and for the magnets in NM2, NM3 and NM4.

The LCW system consists of 3 pumps, normally we use 2, and they are located in the LCW room on the north side of the NS2 Service Building.

Here we see that pumps #2 and #3 are off.

The Blue Box controller
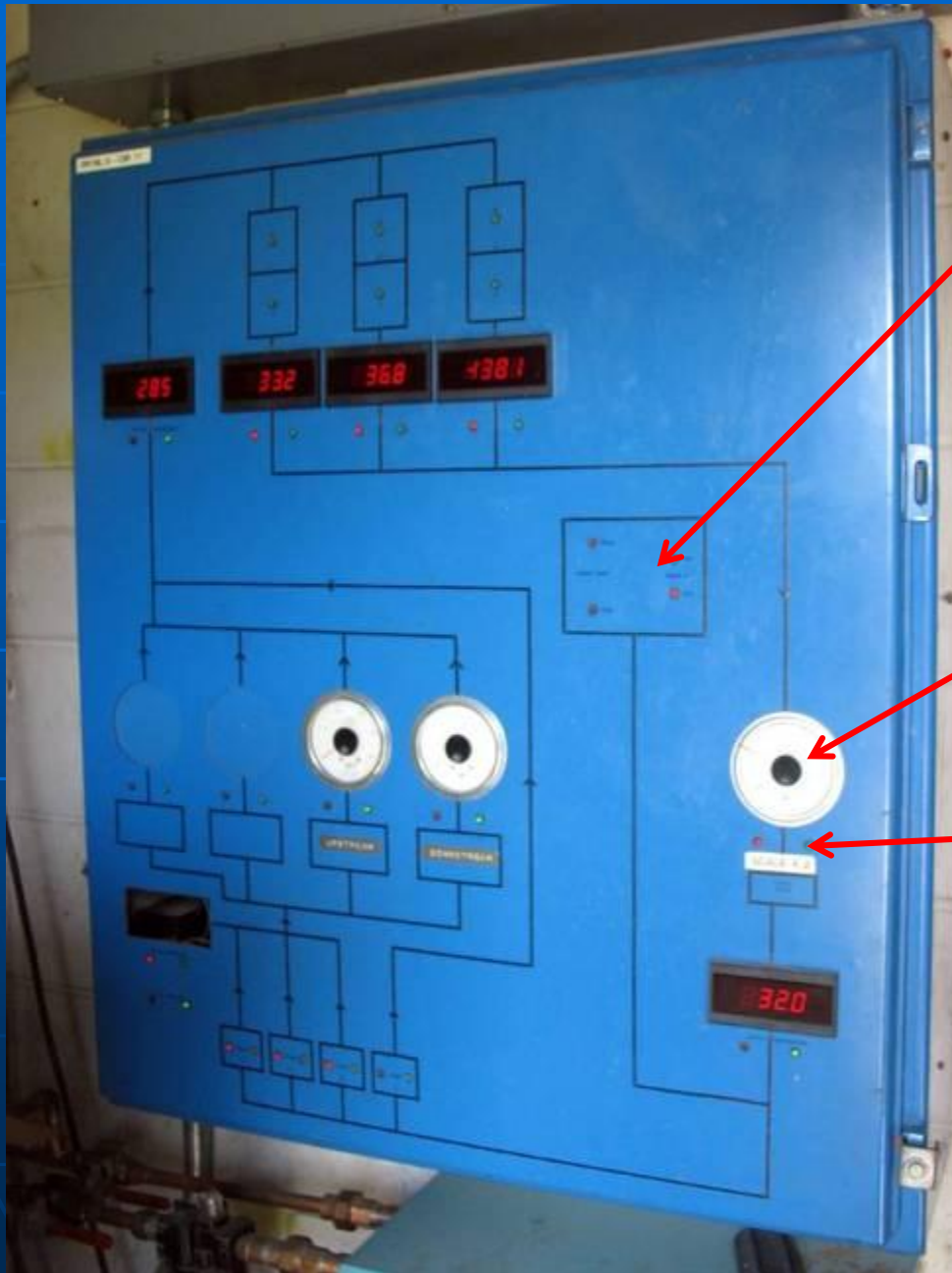
Make-up indicator

Flow meter shows the rate of the water flowing through the pipes.

The System LEDs show that the system is on.

Here we see the flow meter at 0

and the red LED is lit, no flow.

Let's open the blue door and see what's inside.

We are mostly concerned with the red panel. The panel has 4 toggle switches for the 3 pumps and below each toggle switch is a black button used to turn on the pump. In addition, to the right is a switch to turn on the makeup for the expansion tank.
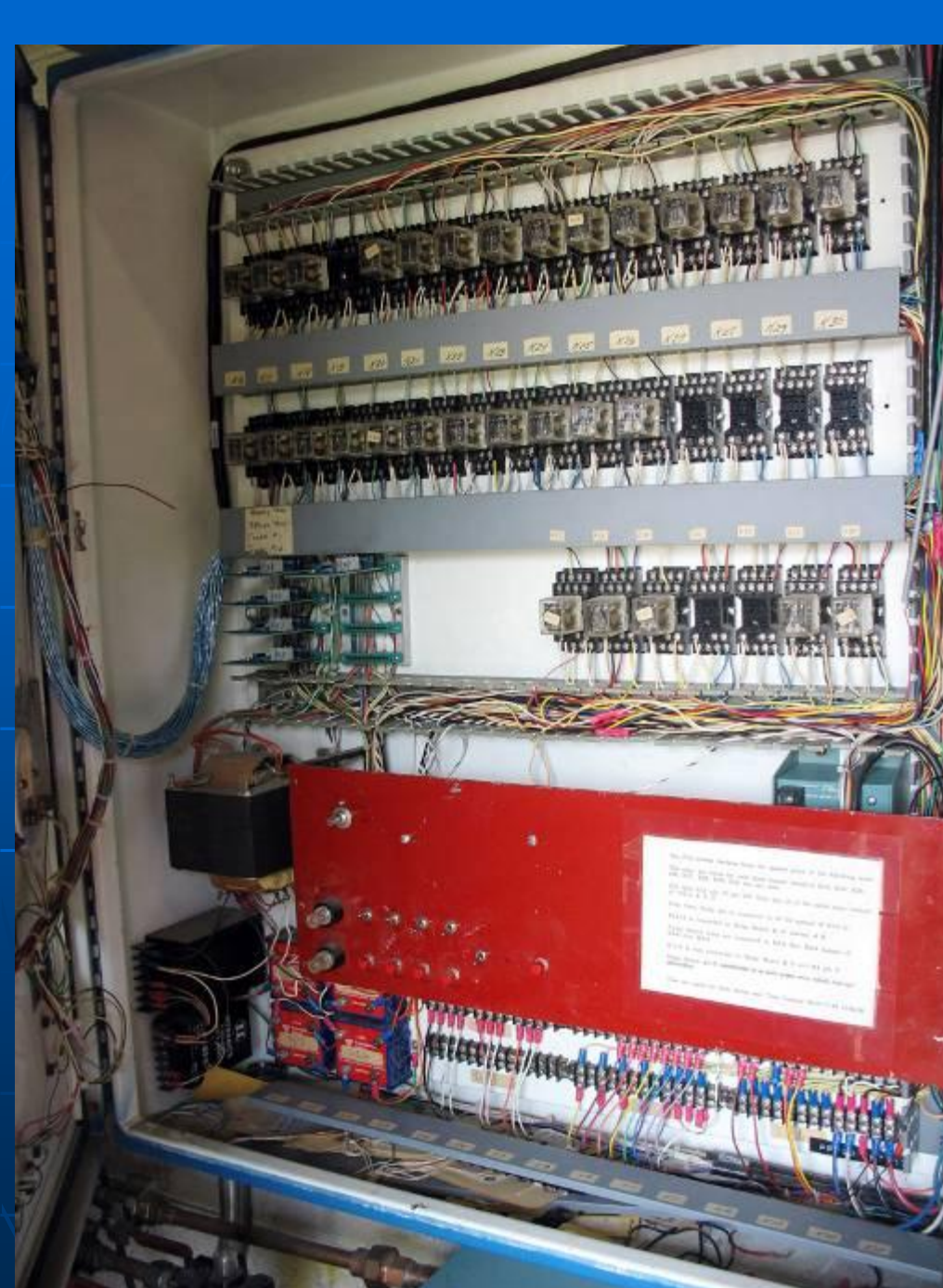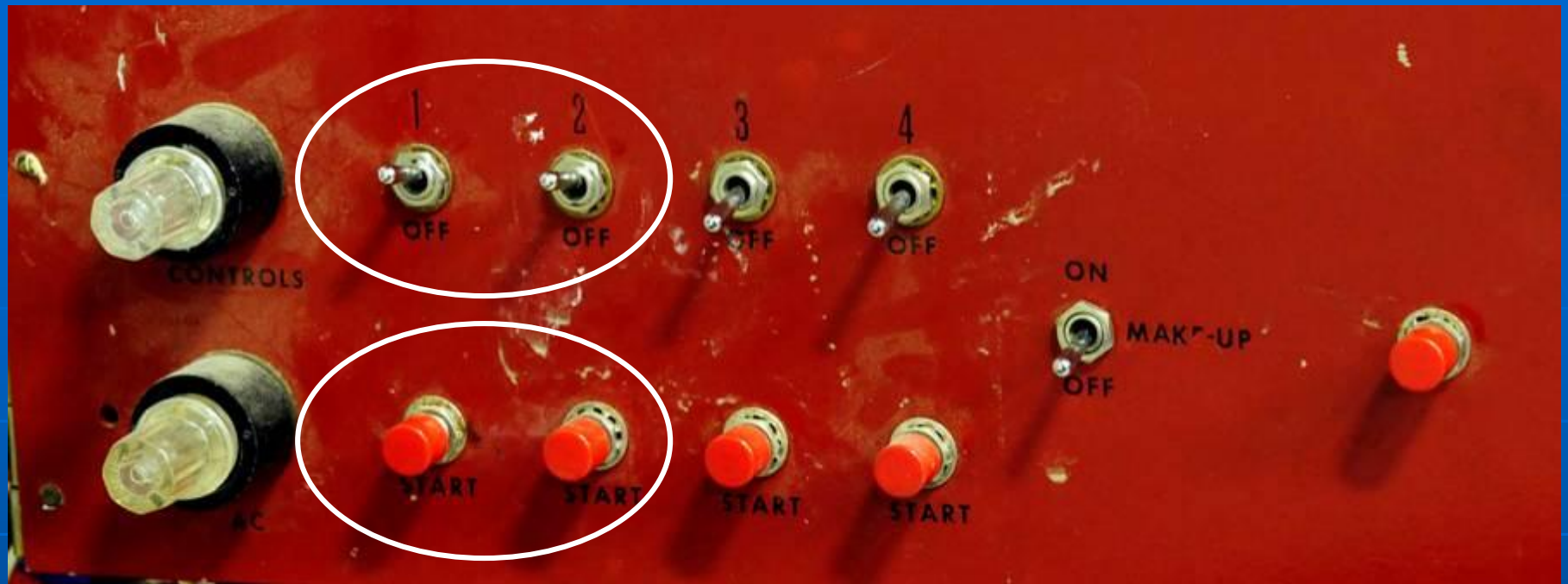
Here we see that pumps number 1 & 2 are being used, the toggle switches are on. To turn the NS2 LCW System on, press both start buttons for pumps 1 & 2 and watch the Flow gauge on the front panel.

Note: The Water Werks group may change which pumps they are using, so DO NOT change the pump switches. Questions contact the Water Group.
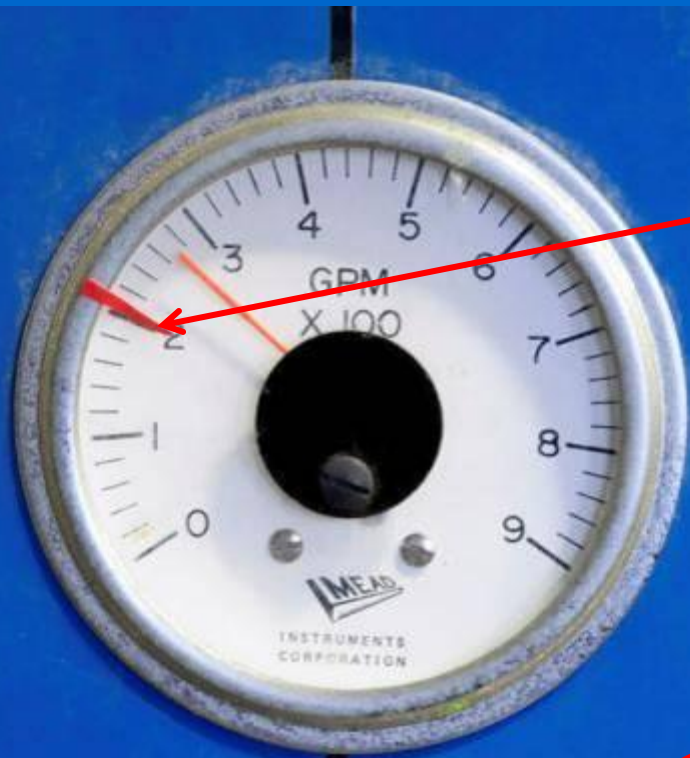
When the system is up and running, the flow meter will show flow, GPM, above the red line and the green LED will be lit.

Pumps #2 and #3 are now on.

We occasionally will need to fill the expansion tank when it gets low. If the expansion tank needs filling we most likely have gotten an ACNET alarm. At the chassis, or blue box, the Make-up LED will be lit.

Here we see the system on, but Make-up is in alarm, we need to add water to the expansion tank.

Note: The next few slides will instruct you on how to add water to the NS2LCW System. Currently the NS2LCW System is running with glycol, therefore we are NOT allowed to add water to the system, only the Fluids department techs are allowed to add glycol.

What does it mean to fill the expansion (Surge) Tank?

Every system has an expansion tank to hold water when the volume fluctuates, cold contracts and hot expands, the water has somewhere to go. It also acts as a buffer for leaks. Because of the leaks, small and large, we will occasionally need to add water to the expansion tank. The expansion tank is a large oval (normally) blue tank that is in the LCW room and usually near the ceiling. On one side of the tank there will be a glass tube, about 1/2 inch in diameter and about 36 inches long, with a ruler attached to it to help determine the level of the tank and how much water needs to be added. The Water Works Group attached 3 tie wraps on the glass tube, a low level, a high level, and a mid point. The mid point tie wrap should line up with the Surge Tank Alarm. So when the level falls below the middle tie wrap an alarm will happen on Acnet, saying we need to add water to the expansion tank. We normally fill it up about 6-8 inches, the level will be above the mid point mark.

The next few slide will explain filling the expansion tank for the NS2 LCW system using pictures.
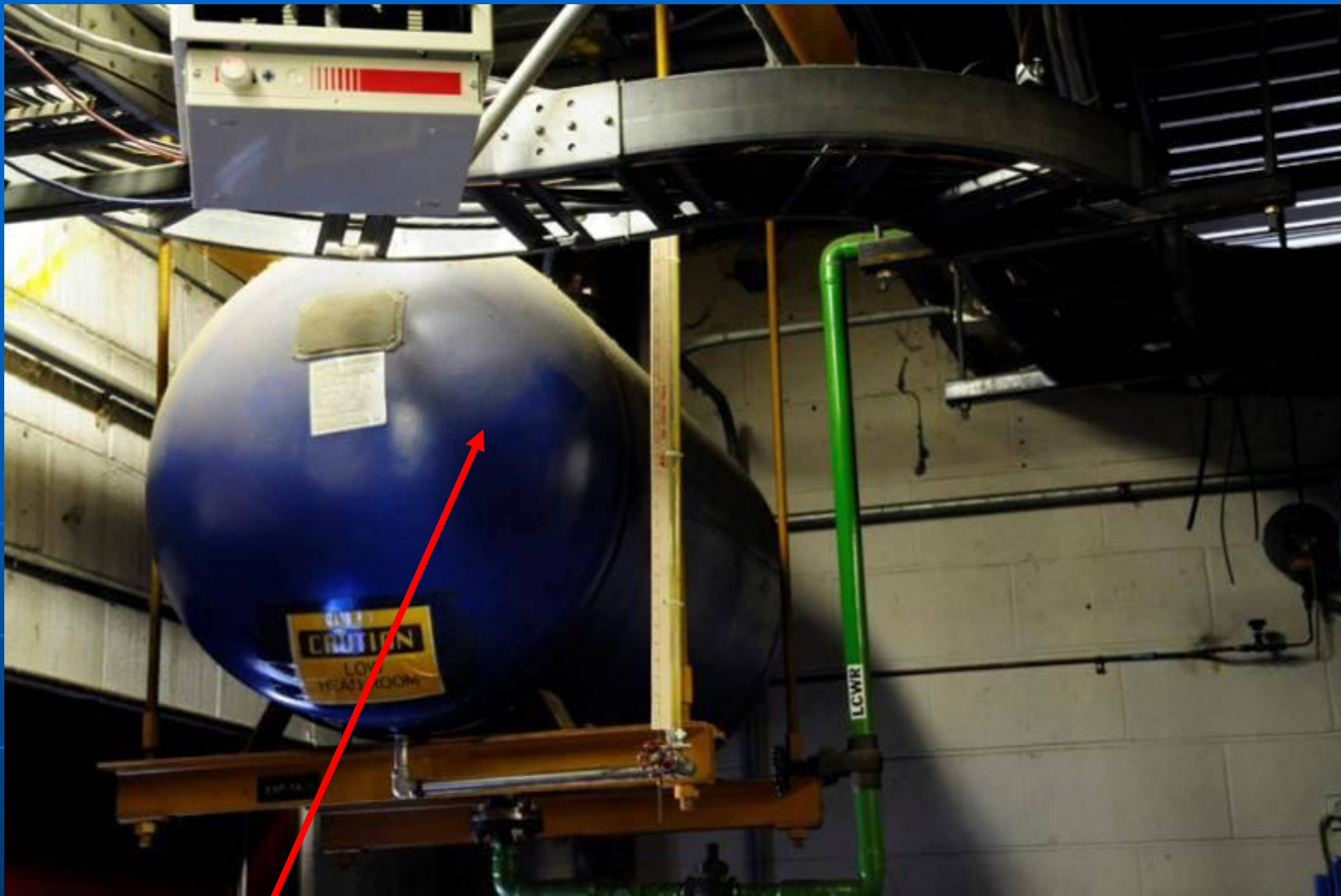
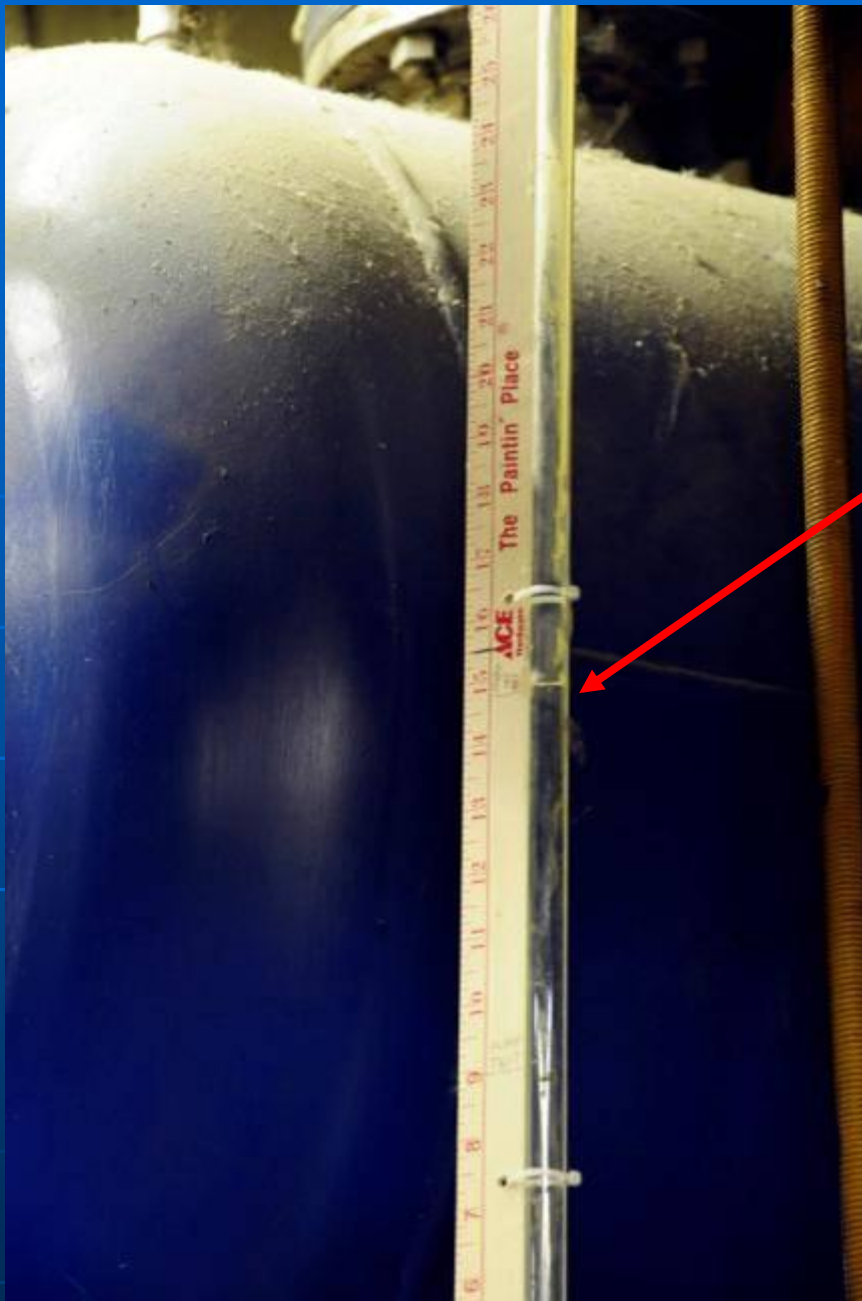The expansion tank is on the ceiling near the east wall.
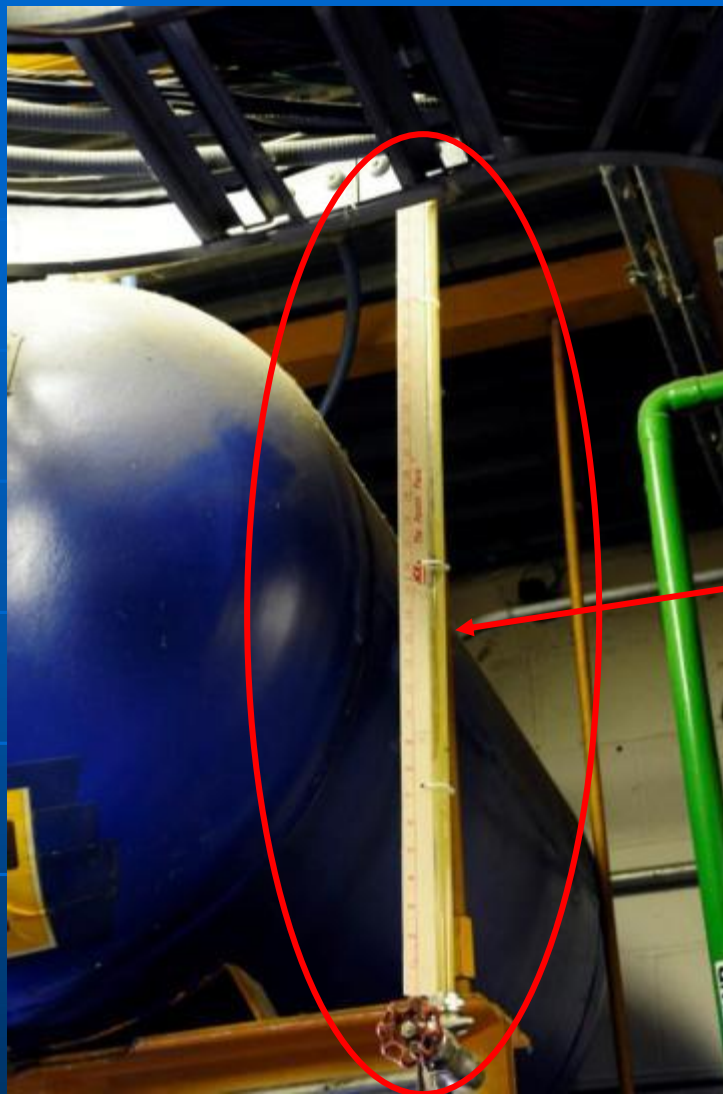
Sight glass

A closer picture of the expansion tank. See the sight glass for filling the tank on the right side of the tank.

Here are the 3 tie wraps.

Here we see the level below the mid level tie wrap.

Which means you will need to add water to the expansion tank.

To add water to the expansion tank, we will need to open 2 valves, flip a switch in the Blue box and the expansion tank will start filling.

Okay, now let's see if we can find those valves.

Now, where are those 2 valves we need to open? In the NS2 LCW room they are behind the orange block.

Back here

The small needle valve is hidden behind the orange block, notice there is a tag to help you find it.

Rotate the black valve until it's open all the way.

Tag

The second valve is also behind the Orange block. See the tag, rotate the red handle to open it.

Tag

Back to the expansion tank, after the valves are open, open the door and to the right of the pump switches you will see the Make-up switch, flip it on.

While you are filling the Expansion tank, keep an eye on the sight glass checking the level. Once the slight glass shows the proper level stop.
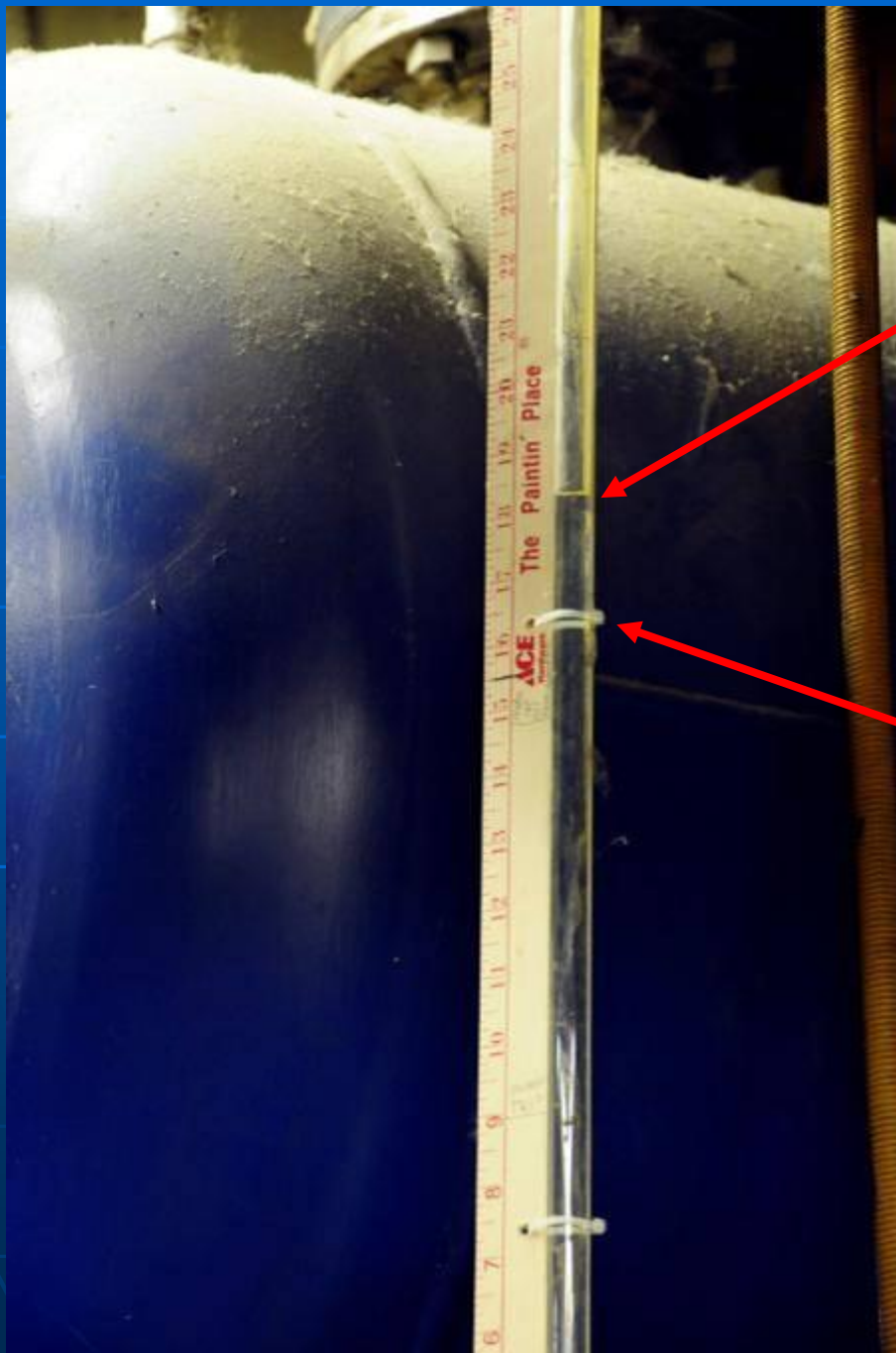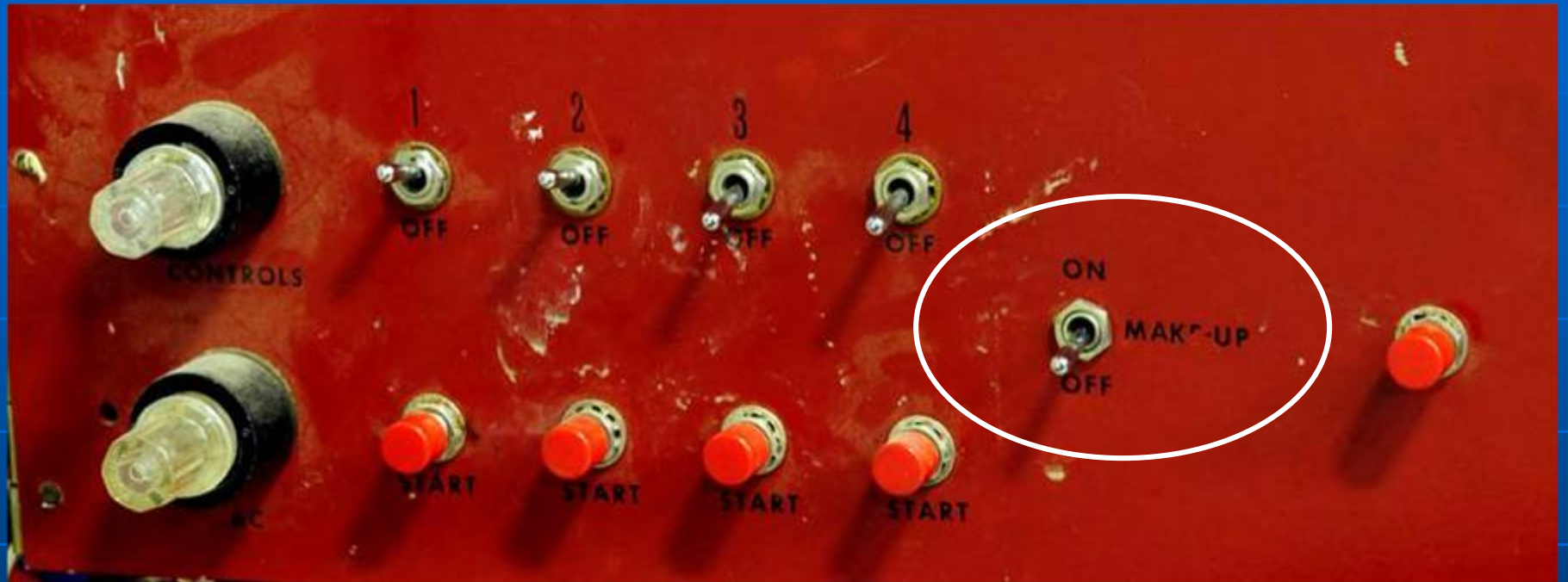
Here we see the level is above the mid level. When filling watch the Make-up panel for the Off LED to turn green.

Mid point tie wrap.

The Make-up LED should now be off.

So now flip the Make-up switch to Off.

The small needle valve needs to be closed

The second valve is also needs to be closed, and now you are finished.

The system is on, Pumps #2 & #3 are running, and Make-up is okay.

da End, stay cool …………………….